

Original Research Article

Superficial Fungal Skin Infections in Patients Attending Zliten Teaching Hospital (North west of Libya)

Abstract:

Aims: This study was carried out to know the frequency of occurrence of different clinical types of dermatophytosis and Pityriasis versicolor and its distribution among different age groups and sexes in particular groups of patients, who attended dermatology clinic of Zliten Teaching Hospital in Zliten (North west of Libya).

Study design: A retrospective study was carried out to analyze the data to find out the distribution pattern of different clinical types of Superficial fungal infection (SFI) in relation to age and sex.

Place and duration of study: The study was carried out for a period of 9 Months, from October 2014 and June 2015. All patients with various skin complaints (3303) were examined for the presence of SFI at outpatient Department of Zliten Teaching Hospital in Zliten, Libya.

Methodology: Wood's lamp examination was performed on patients with suspected SFI. Also, skin scrapings, nail clippings and infected hair samples were examined for fungal elements under age group of the followed by % in the bracket. Under high power of the in 20% KOH mount under high power of microscope. A definitive diagnosis was based on the culture characteristics of the fungal growth.

Results: A total of 161(4.9%) of 3303 patients were found to be suffering from SFI. The majority of the patients were of less than 7 years of age followed by age group from 21-27 years (14.9%). Male to female ratio was 1.2:1. The most frequent clinical pattern was, Tinea capitis (25.5%), followed by Tinea pedis (22.4%), Tinea corporis (21.7%) and Pityriasis versicolor (18.6%). Please write number and then % in bracket

Conclusion: The majority of patients were the younger age groups. Tinea capitis was the most frequent superficial fungal infection under 14 years of age, and Pityriasis versicolor was the most frequent fungal infection in the age group 13-20 years.

Key words: Superficial fungal infection (SFI), Dermatophytosis, Pityriasis versicolor, tinea capitis.

1- Introduction:

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The Fungi are living organisms present in our environment and some fungi are considered to be normal flora such as *Malassezia* species. However, these organisms can affect humans under certain circumstances and cause disease. [1].

SFI of skin and its appendages is a common health problem worldwide. Dermatophytosis and Pityriasis versicolor are the main SFI in humans. The risk factors are hot humid environment and contact with animals.

Furthermore, the non-dermatophyte moulds could be a cause of fungal infection of nails (Onychomycosis) [2]. Fungal infections of skin, nails and hairs are one of most frequent diseases and in the last decades, the prevalence of fungal infections of skin and appendages has increased to affect around 25% of population of different world societies [3]. Marques *et al* (2000) found that Dermatophyte infections of skin affect one fifth of world's population [4].

The SFI are mainly confined to stratum corneum (upper layer of Epidermis) and cornfields appendages (hairs and nails) [2]. Dermatophytosis is a group of important superficial fungal infections of skin and its appendages and is caused by three etiologic species of dermatophytes, which are *Microsporum*, *Trichophyton* and *Epidermophyton*, and each type of these three is characterized by specific morphologic features of cultured colonies and of Macroconidia under Microscope. Dermatophyte infections of skin is also known as ringworm infection and named after affected part of the body, e.g. *Tinea capitis* and *Tinea pedis* [5]. Symptoms and signs of Dermatophyte infections of skin and its appendages differ according to the affected site of the body and the source of fungi. Generally, skin lesions are scaly well-defined erythematous plaques with active margin showing more scales with or without vesicles and pustules. The lesions tend to extend peripherally and clear centrally. Zoophilic fungi exhibit more inflammation compared to anthropophilic fungi [2]. Another common SFI is Pityriasis versicolor which is mainly caused by *Malassezia* species, which is yeast, and manifested as round or oval patches in different colours (white, red and brown) with fine scales [2,6].

The risk factors for SFI are hot, humid climate, which encourages sweating and appearance of fungal infections of skin and furthermore, contact with infected animals, like cats could lead to skin infection of humans with zoophilic fungi [6].

In Libya, few studies were conducted about SFI; furthermore, no previous studies about this issue were performed in Zliten. To know about the Epidemiology of dermatophytosis and Pityriasis versicolor, in this area of Libya, we conducted this study.

2- Methods and subjects:

2.1. Area of Study:

Zliten is a Libyan city with more than 263,000 people and located on Mediterranean Sea about 150 kilometres east of Tripoli, with hot weather and high humidity in summer months [7].

68 **2.2 Objectives:**

69 This study carried out to know the Epidemiology of dermatophytosis and Pityriasis versicolor in Zliten
70 (North west of Libya).

71 **2.3. Methods:**

72 The data for all patients was used from retrospective study. All patients who came for
73 dermatological consultation at outpatient Department of Zliten Teaching Hospital were enrolled. The
74 study was carried out during the period from 01.10.2014 to 30.06.2015. All patients belonged to the
75 area of study. Patients were examined with wood's lamp. Skin scrapings; nail clippings and hair bits
76 were examined under microscope in 20% KOH mount for fungal elements. The final diagnosis of the
77 fungus was based on KOH mount for Pityriasis versicolor and KOH mount and cultural characteristics
78 for dermatophytes. Scrapings were taken with sterile scalpel on a clean glass slide and a drop of 20%
79 potassium hydroxide (KOH) was added and then covered with a glass cover slip and then examined
80 under microscope. For culture purposes, the scraped site was cleaned aseptically with 70% ethanol
81 and specimens were directly collected into sterile petri dishes. The sample was inoculated on
82 Sabouraud's dextrose agar supplemented with chloramphenicol and cycloheximide. The plates were
83 incubated at 26°C and the growth of cultures was observed twice weekly and petri plates were
84 discarded only after 3 weeks in the absence of growth.

85 **2.4. Statistical analysis:**

86 The data were analysed with use of SPSS 20 to study the distribution and frequency of superficial
87 fungal infections of skin, hairs and nails.

88 **Results:**

89 A total of 3303 patients sought medical advice because of skin problems at outpatient Department
90 of Zliten Teaching Hospital. In this study, 161(4.9%) patients were found to have SFI, 88(54.7%) were
91 males and 73(45.3%) were females. The ratio of male to female was 1.2:1. The age of patients
92 ranged from 1 to 80 years (mean, 25.3 years). Of 161 patients, 37(22.9%) of patients were in the age
93 group 0-6 years, followed by age group from 21-27 years (14.9%). We observed that 36% of patients
94 with SFI were less than 14 years old (childhood age group). Nearly 34.2% were found to be in age
95 groups varying from 14 to 34 years, which represent adolescence and adulthood. The age groups
96 from 35 to 55 years were found to represent 24.2% of total. From above mentioned results, we find
97 out that about 94.4% of patients with superficial fungal infection are less than 56 years old. The
98 frequency of occurrence of superficial fungal infections in different age groups and sex are shown in
99 (Figure 1) and (Table 1).

100 Tinea capitis was found to be the most common clinical type in children below 7 years of age
101 25(67.6%). Pityriasis versicolor was seen in 6 (46.2%) in age group 14-20 years.

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Table 1. The frequency of different superficial fungal infections in 161 patients and their age-wise distribution.

Diagnosis	Number (%)													
	Different age groups (years)											gender		Total Number (%) of each clinical type
	0-6	7-13	14-20	21-27	28-34	35-41	42-48	49-55	56-62	63-69	>=70	Male	female	
Tinea capitis	25 (67.6)	10 (47.6)	4 (30.8)	1 (4.2)	1 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	23 (26.1)	18 (24.7)	41 (25.5)
Tinea faciei	3 (8.1)	0 (0.0)	0 (0.0)	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.1)	3 (4.1)	4 (2.5)
Tinea corporis	5 (13.5)	3 (14.3)	3 (23.1)	8 (33.3)	4 (22.2)	4 (33.3)	3 (20)	4 (33.3)	0 (0.0)	0 (0.0)	1 (25)	19 (21.6)	16 (21.9)	35 (21.7)
Tinea manuum	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.4)	1 (0.6)
Tinea cruris	1 (2.7)	0 (0.0)	0 (0.0)	2 (8.3)	0 (0.0)	1 (8.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.3)	2 (2.7)	4 (2.5)
Tinea pedis	3 (8.1)	2 (9.5)	0 (0.0)	2 (8.3)	4 (22.2)	5 (41.7)	8 (53.3)	6 (50)	3 (75)	1 (100)	2 (50)	22 (13.7)	14 (19.2)	36 (22.4)
Tinea unguium	0 (0.0)	4 (19.1)	0 (0.0)	1 (4.2)	2 (11.1)	0 (0.0)	3 (20)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (3.4)	7 (9.6)	10 (6.2)
Pityriasis versicolor	0 (0.0)	2 (9.5)	6 (46.2)	9 (37.5)	6 (33.3)	2 (16.7)	1 (6.7)	2 (16.7)	1 (25)	0 (0.0)	1 (25)	18 (20.5)	12 (16.4)	30 (18.6)
Total Number (%) in each age group	37 (22.9)	21 (13)	13 (8.1)	24 (14.9)	18 (11.2)	12 (7.5)	15 (9.3)	12 (7.5)	4 (2.5)	1 (0.6)	4 (2.5)	88 (54.7)	73 (45.3)	161 (100)

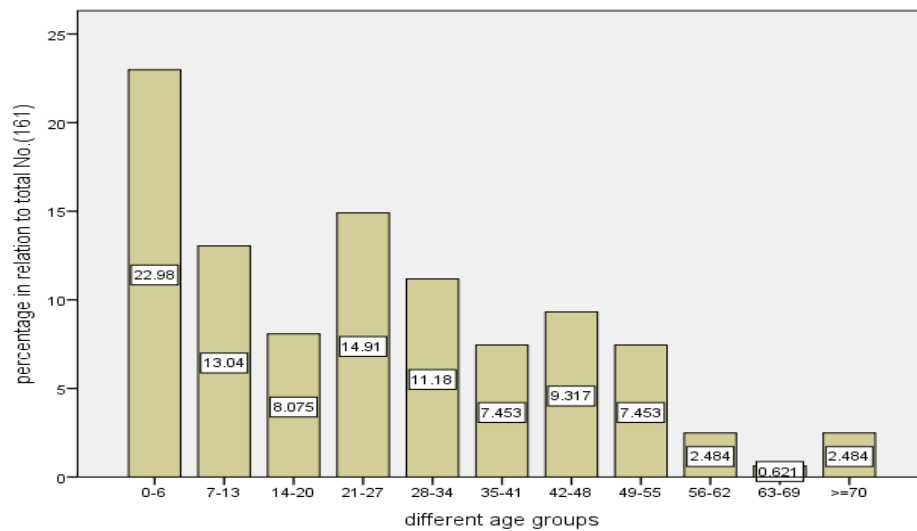


Figure 1. Graph, representing the frequency of superficial fungal infections in different age groups

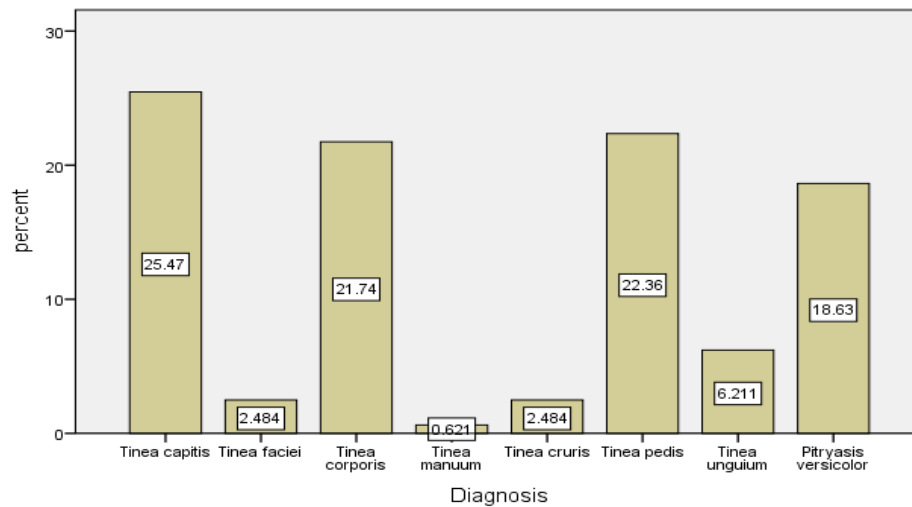
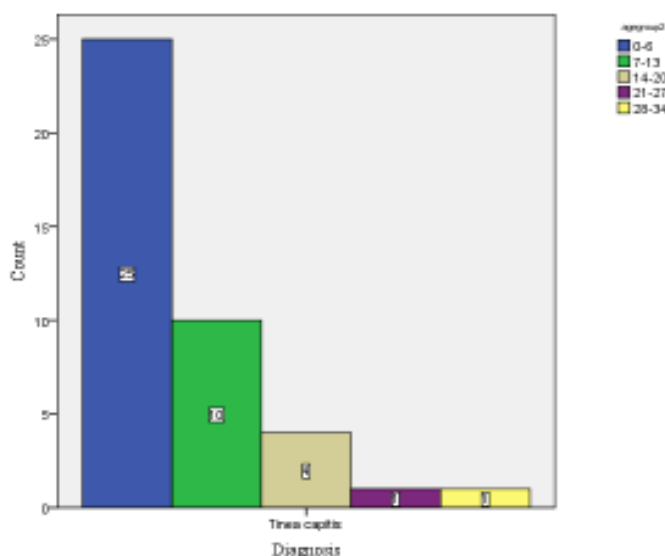


Figure 2. Frequency of each type of superficial fungal infections.

110 The most common fungal infection was Tinea capitis (25.5%), followed by Tinea pedis, which
 111 represented 22.4% of total cases of superficial fungal infections, followed by Tinea corporis (21.7%)
 112 and Pityriasis versicolor (18.6%). However, Tinea unguium represented only 6.2% of total superficial
 113 fungal infections. The lowest frequent superficial fungal infection was Tinea manuum 1(0.6%)
 114 (Figure2).

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115 The patterns of specific types in relation to different age groups were characteristic. Regarding
 116 distribution of Tinea capitis in different age groups, children before 13 years old were found to be
 117 more susceptible. Adults were rarely to be affected with Tinea capitis. C
 118 Changing pattern of frequency and distribution of Tinea capitis in relation to early age groups
 119 (childhood and young adults) is given in figure 3. Conversely, Pityriasis versicolor was found to occur
 120 more frequently between 13 years and 35 years old (Figure 4). Tinea pedis were more frequent in the
 121 age groups from 28 to 55 years (Table1).
 122



123 Figure 3. Changing pattern of frequency and distribution of tinea capitis in relation to age groups
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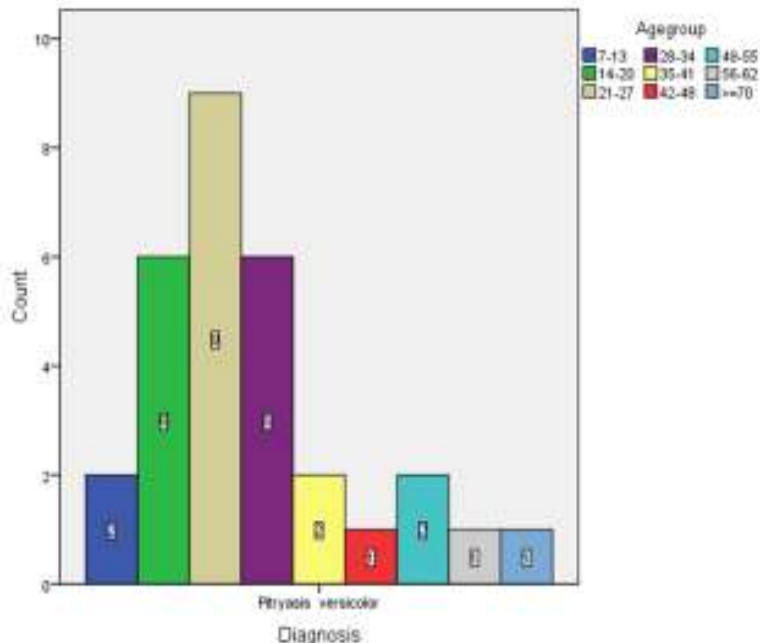


Figure 4. Frequency and distribution of Pityriasis versicolor in different age groups.

Discussion:

The real prevalence of superficial mycoses in Libya is not known because of SFI are not noticeable diseases [8].

In this study the mean age of patients with SFI was 25.3 years, which is relatively similar to results of studies conducted in Kosova (30.8) [9] and in Monastir region in Tunisia (33 years) [10].

The frequency of fungal infections was dramatically reduced after 55 years of age and this corroborate the finding in one Egyptian study [11], and opposite the finding of study conducted in Malaysia, in which the most of patients were older than 50 years [12]. This variation may be related to variations in demography, geography and exposure to risk factors.

Male to female ratio in our study was 1.2, identical to result in study conducted in Malaysia, and opposite what was found in Tunisia with male to female sex-ratio (0.82) [10,12].

In this study, the most susceptible age group was children less than 7 years, similar to what was found in Tripoli (Libya) [8], in which the majority of patients (85%) were children less than 15 years old, and also similar distribution was found in patients attending to some hospitals in Egypt and the susceptibility was high to tinea capitis, same to our finding [11]. The second more affected age group in our study was from 21 years up to 27 years, showing more frequent Pityriasis versicolor. While in study conducted in India by (Kaur *et al*, 2015) the age group 21–30 years was the most affected followed by age group 31–40 years [6].

146 In study about childhood dermatomycoses in Sfax Hospital in Tunisia, They have found that Tinea
147 capitis was the most frequent before 13 years of age, and Pityriasis versicolor was the most frequent
148 after 13 years of age. This finding corroborated with our results [13].

149 In our study tinea capitis represented 25.5% of all superficial mycosis, taking in consideration that
150 candidiasis were not involved in our study, this distribution of Tinea capitis is similar to that found in
151 patients attended to three hospitals in Egypt, and in Sfax (Tunisia), which found to be 69.4% in
152 Tunisia and 28.6% in Egypt and followed with Tinea pedis in our study and in Egypt, but followed with
153 Tinea corporis in Sfax (Tunisia). Tinea corporis in our study has represented 21.7% of total while has
154 only formed about 15% in some hospitals in Egypt [11,13].

155 **Conclusion:**

156 Fungal infection is worldwide health problem and this study has improved our understanding of
157 epidemiology of such common SFI in Zliten area. About 22.9% of infected patients were less than 7
158 years old, followed by age group from 21-27 years (14.9%). In contrast, Infection was less frequent
159 after age of 55 years (5.6%). The most frequent clinical type was Tinea capitis (25.5%), followed by
160 Tinea pedis, Tinea corporis and Pityriasis versicolor in descending order (22.4%, 21.7%, 18.6%).

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